Claims

1. Method for grinding a rotationally-symmetrical machine part (17) with two axle parts (18, 19) and a center part (20) situated therebetween that has an enlarged diameter and on which is embodied an active surface (22) in the shape of a truncated cone surface with a cross-section that has a contour that is a straight line or is curved, whereby said machine part (17) held at its ends and driven to rotation is ground in a single clamping,

in that a grinding spindle (14) with a first grinding wheel (15) that is cylindrical in shape and has a straight-line or conforming curved circumferential contour is positioned perpendicular to said active surface (22), whereby the axial extension of said first grinding wheel (15) covers the radial angular extension of said active surface (22) and the positioning occurs in that said first grinding wheel (15) and said machine part (17) are moved relative to one another in the direction of its longitudinal axis (23),

and in that cylindrical exterior surfaces (24) located on said machine part (17) are ground using longitudinal grinding with a second grinding wheel (16) that is situated uniaxially with said first grinding wheel (15) on said grinding spindle (14),

whereby said grinding spindle (14) acts successively with said first grinding wheel on said active surface (22) and with said second grinding wheel on said cylindrical exterior surfaces (24), whereby it pivots about two pivot axes (12, 13) that are perpendicular to one another and is displaced relative to said machine part (17) in the direction of its longitudinal axis (23) and perpendicular thereto, X-axis [sic].

2. Method in accordance with claim 1, characterized in that the width of said second grinding wheel (16) is less than that of said first grinding wheel (15).

3. Method in accordance with claim 1 or 2, characterized in that cylindrical exterior surfaces (24) situated on said machine part (17) are ground using rough-grinding.

4. Method in accordance with claim 1 or 2, characterized in that cylindrical exterior surfaces (24) located on said machine part (17) are ground using plunge-cut grinding.

5. Method in accordance with any of claims 1 through 4, characterized in that said machine part (17) is clamped between centers (6, 7) and driven to rotate by at least one of said centers (6).

6. Method in accordance with any of claims 1 through 5, characterized in that when said machine part (17) is held horizontally, said grinding wheel (14) is pivoted about a vertically running first pivot axis (12) and about a second pivot axis (13) that runs horizontally.

7. Apparatus for grinding a rotationally-symmetrical machine part (17) with two axle parts (18, 19) and a center part (20) situated therebetween that has an enlarged diameter and on which is embodied an active surface (22) in the shape of a truncated cone surface with a cross-section that has a contour that is a straight line or is curved, in particular for performing the method in accordance with any of claims 1 through 6,

- with tension and drive members for clamping said machine part (17) at its end-faces and for rotationally driving it ,

- with a grinding spindle slide (9) that can be moved in a direction running transverse to the longitudinal axis (23) of said machine part (17),

- with a device for mutual longitudinal displacement of said machine part (17) and said grinding spindle slide (9) in a direction parallel to said longitudinal axis (23) of said machine part 17,

- with a grinding spindle (14) that is arranged via two pivot axes (12, 13) that are

perpendicular to one another on said grinding spindle slide (9),

- and with two grinding wheels (15, 16) that are borne uniaxially on said grinding spindle (14) and that are rotationally driven thereby,

- of which said first grinding wheel (15) intended for grinding said active surface (22) situated on said machine part (17) has a width that corresponds at least to the radial angular extension of said active surface (22),

- while said second grinding wheel (16) intended for grinding cylindrical circumferential surfaces (24) has a narrower width,

- and in which said grinding wheels (15,16) are mounted overhung on one and the same side of said grinding spindle (14).

8. Apparatus in accordance with claim 7, characterized in that said tension and drive members for clamping said machine part (17) are formed by sleeves (4, 5) that are attached to a workpiece headstock (2) and tailstock (3) and that centeringly engage with centers (6, 7) disposed on them end-face bores (37) of said machine part (17), and in that at least said center (6) disposed on said workpiece headstock (2) is provided with a coupling that is mechanically linked to said end-face bore (37) of said machine part (17) via tension members that act radially from inside to outside for the purpose of rotationally carrying it.

9. Apparatus in accordance with claim 8, characterized in that said coupling is embodied as a split cone coupling, the outwardly spreading tensions members of which are embodied as clamping jaws (36) and are arranged in the region of the tip of a longitudinal bore (30) of the shaft (5) situated on said workpiece headstock (2) and in that said clamping jaws (36) are actuated by a connecting rod (31) that passes through said longitudinal bore (30) and in the region of said clamping jaws (36) is provided with an actuating cone (33).

10. Method in accordance with claim 8 or 9, characterized in that at their shaft (4, 5) said centers (6, 7) located on said workpiece headstock (2) and/or tailstock (3) are supported by one or more rests (26, 27).

11. Apparatus in accordance with any of claims 7 through 10, characterized in that said tension and drive members for clamping and for rotationally driving said machine part (17) are disposed on a grinding table (8) that can be moved in the longitudinal direction of said machine part (17) relative to said grinding spindle slide (9).

12. Apparatus in accordance with any of claims 7 through 11, characterized in that arranged on said grinding spindle slide via a first pivot axis (12) that runs perpendicular to its displacement plane is a grinding headstock (11) on which said grinding spindle (14) is pivotably disposed via a second pivot axis (13) that runs perpendicular to said first pivot axis (12).